M E M O R A N D U M

DATE: July 16, 1990

TO: All Interested Parties

FROM: Nevada Division of Environmental Protection,
Bureau of Wastewater Treatment Services,
(775) 687-4670

SUBJECT: **Pumping Station Design and Submittal Criterion, Document WTS-14**

Complete plans and specifications for all pumping stations which will be used to convey untreated, partially treated or fully treated wastewater must be submitted to NDEP and approved prior to the start of construction. This is in accordance with NRS 445.214.2 and NAC 445.180. Prior to the initiation of design review by NDEP a complete application for a discharge permit which covers these facilities must have been received or a permit issued. In most cases this will be the discharge permit for the treatment works. Review and approval of plans and specifications may occur before the permit has been issued but construction of the pumping station may not start until after the permit has been issued.

NDEP's minimum requirements for a complete and acceptable pumping station design submittal is listed below. Additionally, NDEP uses the following references as guidelines for review and approval of pumping stations: Recommended Standards for Sewage Works by the Great Lakes - Upper Mississippi River Board Of State Sanitary Engineers (Ten State Standards), American Society of Civil Engineers Manual of Practice (MOP FD-4), Federal E.P.A. Manuals.

MINIMUM REQUIREMENTS FOR A COMPLETE AND ACCEPTABLE PUMPING STATION DESIGN SUBMITTAL

1. The submittal must list the name of the Owner, the Permittee and the permit number of the existing or pending permit.

2. The plans and specifications must be prepared by or under the direction of a qualified Nevada Registered Professional Engineer. Preliminary plans which meet the minimum requirements for a complete and acceptable submittal will receive a preliminary review by NDEP. Approval will only be given after a complete set of plans and specifications signed and stamped by a Nevada Registered Professional Engineer are received.

3. Every complete submittal of plans and specifications must meet the applicable requirements listed below and contain the applicable signed check list(s).

   A. Requirements of Federal Government for Treatment Works Grants/Loans (Document #WTS-10)..

   B. Requirements of Nevada Revised Statutes (Document #WTS-11).

   C. Requirements of Nevada Division of Environmental Protection (Document #WTS-12).

4. The proposed area to be served by the pumping station must be presented along with a discussion of the current and expected future development of the area.

5. The design average daily flow and peak hourly flow must be presented with justification of the selected rates.

6. The location of the l00 year and 25 year flood plans must be presented.

7. The topography of the area, soils information, nearby surface waters, nearby water supply wells, adjacent land use and predominant wind direction must be presented.

8. The plan and profile of the force main and a detail of its termination must be presented.

9. An analysis demonstrating that the hydraulic conduits down stream of the lift station can handle the expected increased flow must be presented.

10. The elevation of all critical components must be presented, including: pump inverts, control and alarm levels, top of wet well, top of dry well, influent line invert(s), the inverts of any overflow to emergency storage.

11. A schematic of all hydraulic conduits on the upstream side of the pumping station is necessary with identification of the point where an overflow would occur if all electrical and mechanical systems should fail. Be aware that the design of most new sewer lines and interceptors must be approved by NDEP prior to construction. Contact the Technical Services Branch for clarification of what plans must be submitted.

12. Calculations of the volume of emergency storage capacity in the wet well, collection system and emergency storage containment which is above the alarm level but below the elevation at which a spill would occur must be presented. Emergency power with an automatic switch over device shall be provided or there shall be enough emergency capacity to contain two hours of peak hourly flow above the high level alarm without a spill. When the pumping station is at a treatment works that is continuously staffed the switch from regular power to emergency power may be manually done.

13. Any containment used for emergency storage in conjunction with a wet well must be continuously available without the need for an operator to switch valves or diversions. The emergency storage must have an alarm to indicate that it contains fluid. It is acceptable to allow the wet well high level alarm to serve this function if the emergency storage is constructed such that all fluid will drain back to the wet well once the wet well level subsides.

14. A high wet well level alarm is required at all pumping stations. The potential environmental and health consequences of a spill, emergency storage capacity, reliability of equipment, and expected response time should all be considered when the alarm system is selected. The minimum alarm is an audio-visual alarm at the lift station site with a battery backup or alternative power source. Either a visual or audible alarm will be acceptable when the lift station is at a continuously staffed treatment works. A complete description of the alarm system with specifications is necessary. Also a discussion of how a responsible person will be notified and the expected response time is necessary.

15. A discussion of how the lift station will be constructed without interfering with existing flows must be presented.

16. The method of disposing of groundwater from dewatering must be presented if any dewatering is expected. Also the expected quantity and quality of the water must be presented.

17. Raw sewage pumps must be capable of passing a 3 inch sphere, be grinder pumps or be protected by a screen or rack that will only allow acceptably sized solids to pass.

18. A minimum of 2 independent pumps are required. The pumps shall be sized so that the remaining pump(s) can handle the expected peak flow with any one pump out of service.

19. All pumps must be capable of automatically repriming if for any reason they should lose their prime.

20. Complete pump specifications are necessary including the pump curves, net positive suction head requirements and the types of fluids which may be pumped, i.e., raw sewage.

21. Individual check valves and shut off valves for each pump must be located outside of the wet well.

22. The wet well and pumps should be designed and selected so that pump starts are not excessively frequent. A minimum of 10 minutes between successive starts is recommended by MOP FD-4 with longer times recommended for larger pumps.

23. A 24-hour emergency telephone number shall be posted at all pumping stations that are not within the treatment facility. The plans and specifications must include the posting. Provision must be made to alert a responsible person to problems at the pumping station when the telephone number is called.

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